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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,027	02/02/2005	Weiping Zeng	ZU-417	8403

7590 08/08/2007  
H. Jay Spiegel and Associates PC  
P.O. Box 11  
Mount Vernon, VA 22121

EXAMINER
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PEPITONE, MICHAEL F

ART UNIT	PAPER NUMBER
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1709

MAIL DATE	DELIVERY MODE
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08/08/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/523,027

**Applicant(s)**

ZENG ET AL.

**Examiner**

Michael Pepitone

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
- Paper No(s)/Mail Date 2/2/05, 4/8/05.

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Fuchigami *et al.* (US Patent 5,925,690).

Regarding claim 1: Fuchigami *et al.* teaches a dental adhesive composition comprising a polyfunctional monomer (component G) based on esters of a polyhydric alcohols (C<sub>3</sub>-C<sub>6</sub>) and methacrylic acids in 0.1-30 weight %, which contain 1-2 hydroxyl groups (glycerine dimethacrylate) (17:19; 17:33-34); monofunctional methacrylates in an amount of 5-50 weight% and 1-50 weight % (components A and B) (15:27-30; 17:40-48); a polymerizable monomer having an acid group in 1-50 weight% (component B) (15:20-21); and an organoboron compound (22:14-17) in 0.1-20 weight% (27:1-5).

Regarding claim 2: Fuchigami *et al.* teaches the basic claimed composition (as set forth above with respect to claim 1) further comprising a filler in 300 weight% or less (27:50-54).

Regarding claim 3: Fuchigami *et al.* teaches the basic claimed composition (as set forth above with respect to claim 1) further comprising a solvent (component D) in 1-80 weight % (15:43-45).

Regarding claim 4-6: Fuchigami *et al.* teaches the basic claimed composition (as set forth above with respect to claim 1) wherein the polyfunctional monomer, glycerine dimethacrylate (17:19) [instant claims 5 and 6] is in an amount of 0.1-30 weight% (17:33-34) [instant claim 4].

Regarding claim 7: Fuchigami *et al.* teaches the basic claimed composition (as set forth above with respect to claim 1) wherein the acid group containing polymerizable monomer is 4-methacryloyloxyethyltrimellitic acid and/or 4-methacryloyloxyethyltrimellitic anhydride (general formula 4) (9:7-9; 9:27-40; 10:27-40).

Regarding claim 8: Fuchigami *et al.* teaches the basic claimed composition (as set forth above with respect to claim 1) wherein the organoboron compound is tributylborane and/or partially oxidized tributylborane (22:14-17).

Regarding claim 9: Fuchigami *et al.* teaches the basic claimed composition (as set forth above with respect to claims 1 and 2) wherein the filler is polymethylmethacrylate (22:61-63; 27:41-44).

Regarding claim 10-13: Fuchigami *et al.* teaches the basic claimed composition (as set forth above with respect to claims 1, 2, and 5) wherein the polyfunctional monomer, glycerine dimethacrylate (17:19) [instant claims 11-13] is in an amount of 0.1-30 weight% (17:33-34) [instant claim 10].

Regarding claim 14: Fuchigami *et al.* teaches the basic claimed composition (as set forth above with respect to claims 1 and 2) wherein the acid group containing polymerizable monomer is 4-methacryloyloxyethyltrimellitic acid and/or 4-methacryloyloxyethyltrimellitic anhydride (general formula 4) (9:7-9; 9:27-40; 10:27-40).

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Regarding claim 15: Fuchigami *et al.* teaches the basic claimed composition (as set forth above with respect to claims 1 and 2) wherein the organoboron compound is tributylborane and/or partially oxidized tributylborane (22:14-17).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto *et al.* (US Patent 6,037,388) in view of Rhienberger *et al.* (US Patent 6,353,039).

Regarding claim 1: Hashimoto *et al.* teaches a dental adhesive composition comprising a polymerizable methacrylate monomer in 30-90 weight% (mono and/or polyfunctional), a polymerizable monomer having a carboxylic acid group in 2-20%, an organoboron compound in 1-30 weight%, and polyfunctional polymerizable monomers based on methacrylic acid esters of a polyhydric alcohols, but does not teach such esters that contain 1-2 hydroxyl groups (4:17-25; 9:54-57; 4:36-60; 9:28-47). However, Rhienberger *et al.* teaches a dental composition comprising dilution monomers (based on methacrylic acid esters), which contain at least 2 polymerizable groups and 1-2 hydroxyl groups (5:29-51). Hashimoto *et al.* and Rhienberger *et al.* are combinable because they are concerned with a similar technical difficulty, namely the preparation of dental materials. At the time of invention a person of ordinary skill in the art would have found it obvious to have combined dilution monomers, as taught by Rhienberger *et*

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*al.* in the invention of Hashimoto *et al.*, and would have been motivated to do so since Rhienberger *et al.* suggests that dilution monomers provide composites with high filler contents (5:30-33), and is an equivalent alternative means of providing a polymerizable composition for dental applications.

Regarding claim 2: Hashimoto *et al.* teaches the basic claimed composition (as set forth above with respect to claim 1) further comprising a filler of 0-60 weight% (4:21-22; 10:35-38; 12:23-29; 13:32-40).

Regarding claim 3: Hashimoto *et al.* teaches the basic claimed composition (as set forth above with respect to claim 1) further comprising a solvent in 10-150 parts by weight, based on 100 parts organoboron compound, specifically 0.1-45 weight % (2:16-21; 4:17-25).

Regarding claims 4-6: Hashimoto *et al.* teaches the basic claimed composition (as set forth above with respect to claim 1), but does not teach polyfunctional polymerizable monomers, based on methacrylic acid esters of polyhydric alcohols, that contain 1-2 hydroxyl groups. However, Rhienberger *et al.* teaches a dental composition comprising dilution monomers (based on methacrylic acid esters), which contain at least 2 polymerizable groups and 1-2 hydroxyl groups (5:29-51) in 0.1-30 weight% [instant claim 4], specifically glycerol dimethacrylate (5:41-42) [instant claims 5 and 6]. Hashimoto *et al.* and Rhienberger *et al.* are combinable because they are concerned with a similar technical difficulty, namely the preparation of dental materials. At the time of invention a person of ordinary skill in the art would have found it obvious to have combined dilution monomers (glycerol dimethacrylate), as taught by Rhienberger *et al.* in the invention of Hashimoto *et al.*, and would have been motivated to do so since Rhienberger *et al.*

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suggests that dilution monomers provide composites with high filler contents (5:30-33), and is an equivalent alternative means of providing a polymerizable composition for dental applications.

Regarding claim 7: Hashimoto *et al.* teaches the basic claimed composition (as set forth above with respect to claim 1) wherein the acid group containing polymerizable monomer is 4-methacryloyloxyethyltrimellitic acid and 4-methacryloyloxyethyltrimellitic anhydride (4:36-37).

Regarding claim 8: Hashimoto *et al.* teaches the basic claimed composition (as set forth above with respect to claim 1) wherein the organoboron compound is tributylborane and/or partially oxidized tributylborane (2:45-50).

Regarding claim 9: Hashimoto *et al.* teaches the basic claimed composition (as set forth above with respect to claim 1) wherein the filler is a polymethylmethacrylate particle (11:34-36).

Regarding claims 10-13: Hashimoto *et al.* teaches the basic claimed composition (as set forth above with respect to claims 1, 2, and 5), but does not teach polyfunctional polymerizable monomers, based on methacrylic acid esters of polyhydric alcohols, that contain 1-2 hydroxyl groups. However, Rhienberger *et al.* teaches a dental composition comprising dilution monomers (based on methacrylic acid esters), which contain at least 2 polymerizable groups and 1-2 hydroxyl groups (5:29-51) in 0.1-30 weight% [instant claim 10], specifically glycerol dimethacrylate (5:41-42) [instant claims 11-13]. Hashimoto *et al.* and Rhienberger *et al.* are combinable because they are concerned with a similar technical difficulty, namely the preparation of dental materials. At the time of invention a person of ordinary skill in the art would have found it obvious to have combined dilution monomers (glycerol dimethacrylate), as taught by Rhienberger *et al.* in the invention of Hashimoto *et al.*, and would have been motivated to do so since Rhienberger *et al.* suggests that dilution monomers provide composites with high

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filler contents (5:30-33), and is an equivalent alternative means of providing a polymerizable composition for dental applications.

Regarding claim 14: Hashimoto *et al.* teaches the basic claimed composition (as set forth above with respect to claims 1 and 2) wherein the acid group containing polymerizable monomer is 4-methacryloyloxyethyltrimellitic acid and 4-methacryloyloxyethyltrimellitic anhydride (4:36-37).

Regarding claim 15: Hashimoto *et al.* teaches the basic claimed composition (as set forth above with respect to claims 1 and 2) wherein the organoboron compound is tributylborane and/or partially oxidized tributylborane (2:45-50).

The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. See attached form PTO-892.

### ***Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Pepitone whose telephone number is 571-270-3299. The examiner can normally be reached on M-F, 7:30-5:00 EST.

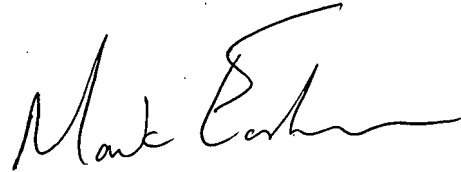
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on 571-272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MFP  
3-August-07



**MARK EASHOO, PH.D.**  
**PRIMARY EXAMINER**

04 / Aug 07